DOCUMENT RESUME

ED 247 106 SE 044 702

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TITLE Life Tracks Series.
INSTITUTION Wisconsin State Dept. of Natural Resources, Madison.
PUB DATE [81]
NOTE 28p.
PUB TYPE Reports - Descriptive (141)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Animal Behavior; *Animals; *Endangered Species; *Ornithology; Resource Materials; Zoology
IDENTIFIERS *Birds; *Wisconsin

ABSTRACT

Presented are descriptions of and information about various endangered species in Wisconsin. They include: the timber wolf (Canis lupus lycaon); Forester's tern (Sterna forsteri); the Canada lynx (Lynx canadensis); Higgins' eye pearly mussel (Lampsilis higginsii); the piping plover (Charadrius melodus); the osprey (Pandion haliaetus); the double-crested cormorant (Phalacrocorax auritus auritus); the peregrine falcon (Falco peregrinus); the bald eagle (Haliaeetus leucocephalus); the massasauga rattlesnake (Sistrurus catenatus); the common tern (Sterna hirundo); the barn owl (Tyto alba); and the pine marten (Martes americana). A map of Wisconsin (showing favorable habitat, general breeding range, former distribution, or migration pattern) accompanies each description. Information on constructing song bird feeders, bird houses, and the use of old, dead trees (snags) by various kinds of wildlife is also presented. A list of some birds that use snags is included. (JN)

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life tracks

Timber wolf

(Canis lupus lycaon)

Originally wolves roamed the U.S. from coast to coast and border to border. But as the country settled, more and more wolf habitat was turned to crop and rangeland. Large prey like deer, moose and beaver grew scarce and the wolf came into conflict with people and their livestock. Today these elusive canids are near extinction in the continental U.S.

Wolves now roam only about 5% of their original range. In the lower 48 states, Minnesota has the sole substantial population. An estimated 1,200 live there in 31,000 square miles of northern forest. About one-tenth of this is primary wolf range. A few remnant populations remain in Upper Michigan. The Isle Royale pack of about 40 wolves is best known. Moose, the major prey on this Lake Superior island, are held in check by the wolves, while the number of wolves is limited by their food source, the moose.

In Canada and Alaska, they hold their own. Alaska supports about 25,000 and Canada has 17,000 to 25,000—a population about as large as it ever was. Canada still pays a bounty and permits trapping.

The eastern timber wolf was once found throughout Wisconsin, especially in forested areas. By 1955 they were rare in the state—down to less than 50 animals confined to the wildest parts of the north. By the time protection was given in 1957, the breeding population was virtually gone. Recent observations show some may have migrated back from Minnesota and Michigan.

The largest wild member of the dog family, wolves are silvery gray or brown as adults and measure 4½ to 6 feet from nose to tip of tail. They weigh 80 to 100 pounds. Built for far ranging travel, they have narrow chests and long legs.

Wolf intelligence and loyalty to others of its kind are remarkable. One male returned 17 nights to the place where his mate was trapped until he too was trapped. Another was observed apparently bringing food to a sick member of the pack.

Social structure of a wolf pack is sophisticated. Under the guidance of one dominant individual, usually a male, the pack of two to 12 works as a unit. Activities, from hunting to raising young, are done as a group. Even though only the dominant male and a chosen female mate, all pack members help dig the den and care for the five to seven sooty-gray pups.

Born in mid-May after a 63-day gestation period (the same as a domestic dog), the pups' slate-blue eyes open about 12 days after birth. They don't develop the wolf's characteristic slanted yellow eyes for about two months.

Pack members begin teaching pups to hunt in mid-July. The awkward pups watch the adults and learn. On their own, pups can bring down small quarry like beaver and rabbits. By

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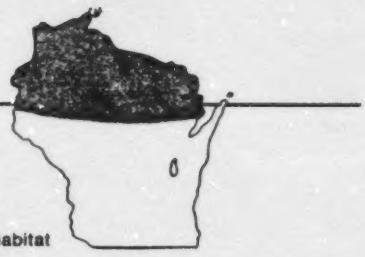


Favorable habitat

September the young wolves are part of the pack stalking deer, elk and moose.

Wolves have been feared and hated by many since the Dark Ages when accounts of unprovoked attacks on people were prevalent across Europe. At that time a rabies epidemic was sweeping the continent and the wolves that did the terrorizing were sick. Wolf expert Dr. L. David Mech says he knows of no healthy wolf attacking a human.

Nevertheless it became a handy villain in literature, folklore and song. There are, to name a few, "Little Red Riding Hood," "The Three Little Pigs," "Peter and the Wolf" and "Who's Afraid Of The Big Bad Wolf"; a person with poor table manners "wolfs" down food and antisocial people are "lone wolves." All in all, a bad image! Not to say that the animal doesn't sometimes do damage—any time two large predators, like people and wolves, overlap there is bound to be competition for food. It may be livestock or deer. But conflict should be dealt with on an individual basis—not by exterminating a whole wolf population.

The eastern timber wolf is listed as "endangered" in the lower 48 states except in Minnesota where it's "threatened." Timber wolves are also on Wisconsin's Endangered Species List.

Recovery plans for the wolf prescribe complete protection in large tracts of northern wilderness range. In bordering zones, direct conflict with livestock might occur. Here, regulated taking of wolves would be allowed as a means of control. Sacrifice of some at the edge of the range will help discourage clashes with people and allow the wolf to multiply undisturbed deep within the wilderness areas.

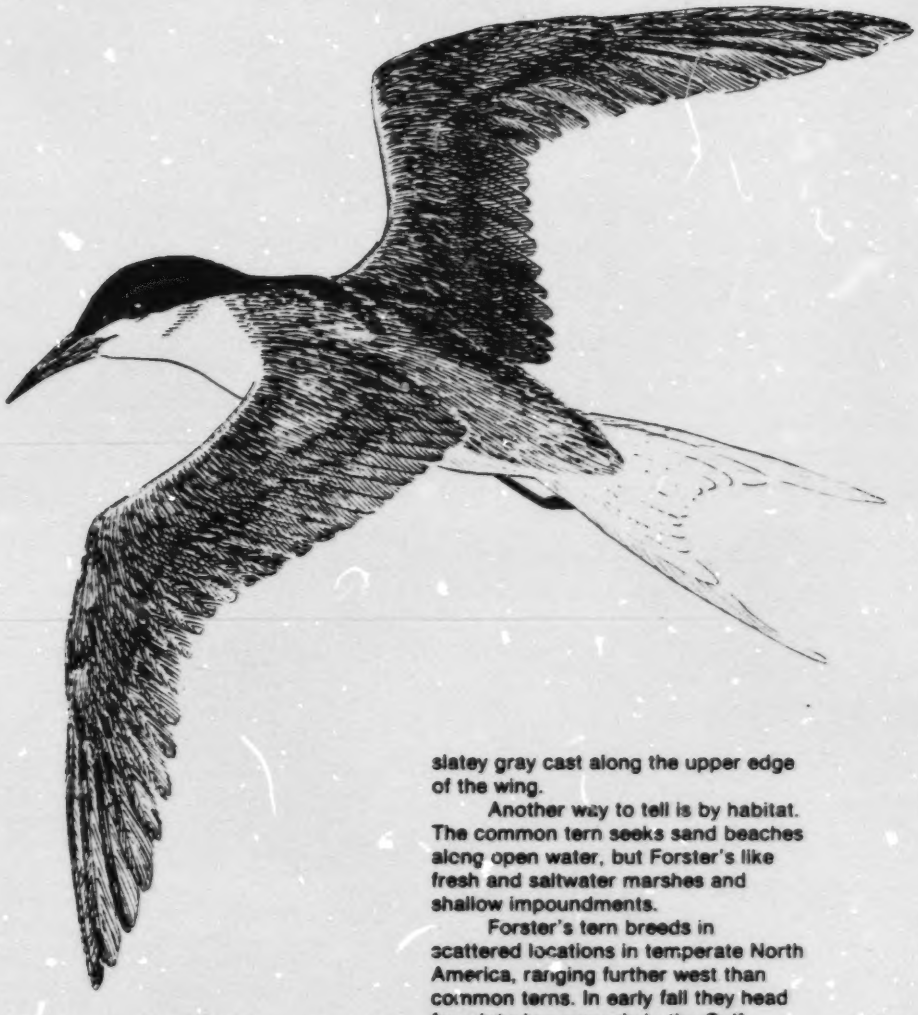
Part of the eastern timber wolf's comeback will have to rely on "people management" because much of its decline can be traced to human exploitation. Awareness programs aimed at informing citizens about program goals and the wolf's important ecological role, are a first step to reshaping human attitudes. In time, perhaps the wolf will no longer be an animal that people want to destroy. It will be one to marvel at and preserve.

by: Inga Brynildson

ELVA HAMERSTROM Madison

Forster's tern
(Sterna forsteri)

General breeding range



Forster's and common terns look so much alike in summer plumage that even John James Audubon didn't recognize them as separate species. It took until 1858 for someone to finally tell them apart. In winter and juvenile plumage, differences are obvious. On Forster's the solid black cap on the head narrows to a patch along the sides of the neck. On the common tern this patch extends back around the nape. Immature common terns show a slatey gray cast along the upper edge of the wing.

Another way to tell is by habitat. The common tern seeks sand beaches along open water, but Forster's like fresh and saltwater marshes and shallow impoundments.

Forster's tern breeds in scattered locations in temperate North America, ranging further west than common terns. In early fall they head for wintering grounds in the Gulf States, and Central and South America.

Forster's arrive in Wisconsin in late April. By mid May, colonies begin nesting. The cup-like nests are built atop muskrat lodges or more often on floating mats of decaying sedge, reeds, grass and algae anchored by cattail rootstock. Some studies suggest that those on active muskrat lodges are most successful—but overall, mortality

is extremely high. Only a third or less of the eggs and chicks survive. There are usually three eggs that take 23 days to hatch. After a few days chicks can run and swim and hide in the marsh grass. They depend on the parents for food and protection until full grown and fledged. Forster's terns eat fish when available but to survive in a marsh they also have to eat many insects like dragonflies and caddisflies.

In the past, Forster's tern probably suffered the same exploitation of eggs and plumes as the common tern but today other factors threaten. The birds are extremely vulnerable to changing water level because they nest on or just above the surface. Wind and wave action, impoundment variations or the natural oscillations scientists call "seiches" can wash out and damage nests. The Forster's stronghold in Wisconsin is Green Bay, where seiche activity can raise or lower water as much as four feet overnight. In the early '70s, high water washed out 80% of the Forster's nesting habitat there. As a result, breeding pairs decreased 95%, from 700 to 35 between 1969 and '78. Eight other smaller colonies remain in the southern half of the state. This is all that is left of the large colonies which once inhabited Wisconsin's scattered, reedy lakes. In 1872, 200 pairs bred in Lake Koshkonong.

Wetland drainage and lakefront development are also a menace. In 1978, harrassed by people, 39 nests were abandoned at Rush Lake in Winnebago County. The terns then set up several smaller colonies in less favorable sites, but all were washed out. Fewer than five chicks survived.

Still another limiting factor is a shortage of nesting surfaces. Experiments are underway with artificial aquatic platforms at otherwise favorable nest sites. These have done wonders for cormorants and ospreys in Wisconsin and perhaps will also provide a remedy for Forster's tern.

by: Inga Brynildson

life tracks

Canada lynx

(*Lynx canadensis*)

Former distribution

Three big cats were native to Wisconsin. The lynx is the mid-sized one. It was known to French trappers as "le chat." Half as big as a cougar and slightly larger than a bobcat, the Canada lynx stretches out more than three feet from head to tail. It weighs 30 pounds and anyone who has ever owned a domestic cat can imagine the inherent ferocity. The lynx is one of the most strictly carnivorous mammals in Wisconsin. It often preys on red fox, rabbit, grouse, squirrel and occasionally on deer. But the snowshoe hare is by far the staple—normally 75% of the diet and up to 90% when plentiful. The porcupine is its toughest quarry. Unlike fisher, lynx are highly susceptible to injury from quills.

After a late spring molt the lynx appears brownish but in autumn the brown coat becomes underfur. Long, gray guard hairs then grow out to give a grizzled. buffy cast.

The Canada lynx is long-legged and with its toes spread, the large, cushiony paws act like snowshoes. It can track swiftly across deep drifts to pounce on a hare or prey on a snowbound deer.

Its close relative, the bobcat, is a lookalike but there are ways to tell them apart. The lynx has longer ear tufts that seem to burn at the ends like black flame and its short tail looks singed and has a solid, black ring at the tip. The bobcat's tail is longer with uneven black mottling.

Another distinction is habitat. Bobcats don't have snowshoe paws and are more abundant in deciduous forests where snow is lighter. Lynx live in coniferous, boreal forests farther north than any cat. Although never common in Wisconsin they were probably found throughout the state in swampy, mature forests until 100 years ago. About then radical lumbering and extensive agriculture did away with prime habitat. Lynx trappers also cut them back.

The abundance of lynx has always been extremely dependent on the snowshoe hare. Canadian snowshoes drop to bitter lows about every 10 years and lynx mortality following such a decline may go as high as 40%. In 1972 lynx migrated to Wisconsin and Minnesota from Canada in a search for food. Unfortunately not all survived. Several carcasses were found that year in Wisconsin.

The Canada lynx is endangered in Wisconsin. It has been protected here since 1957 when hunting and trapping were closed and bounties removed. But every now and then a lynx will wander into a trap or be mistaken for a bobcat and shot.

Nationwide the Canada lynx is classified as "unique." This is for species that require local protection or for those whose past and present status are not well enough known to determine their requirements. The lynx is unique for the latter reason. Its solitary, secret nocturnal ways make it difficult to keep tabs on.

During the day it hides in rotting logs or rock crevices. At night the lynx crouches on boulders and trees overlooking animal runs and waits to ambush its prey. Its powerful back legs are built for pouncing and fast starts but not endurance. A lynx can jump 15 feet in the air from a stand but maintain its 12-mile-an-hour top speed for only a few minutes. A good swimmer, it can span the full width of a wide river if need be.

Among woodsmen the Canada lynx is renowned for its cat curiosity. There are tales of people being tracked in the wilderness for miles with no apparent threat of attack. Ancient Greeks and Romans attributed superior intelligence and eyesight to the lynx. Its keen senses are also fabled in German folklore and mythology.

Today few people know the lynx, so our regard for it is put to the test.

Will it survive or not? The question is still unanswered.

by: Inga Brynildson

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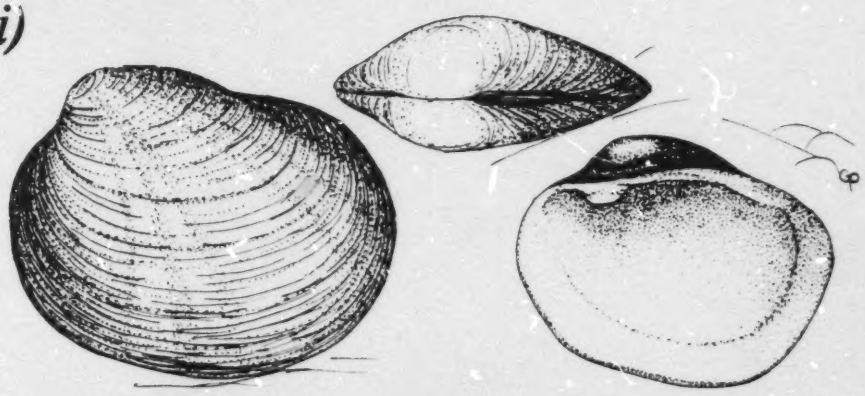
Higgins' eye pearly mussel

(Lampsilis higginsii)



When we think of shells, it's easy to imagine colorful conchs on a tropical seashore. In Wisconsin, we expect little more than battered, brown, dull river clam shells. And a clam's a clam, right? Actually, Wisconsin's fresh waters are inhabited by 40 to 50 clam species. One is endangered in Wisconsin. The Higgins' eye pearly mussel, first identified in 1928, was added to the U.S. endangered species list in 1976.

The world range of this ordinary looking mussel is the upper Mississippi River, from Hudson, Wisconsin south to Iowa and Illinois and larger tributaries such as the St. Croix and Wisconsin Rivers.

When we find a broken clam shell, it's hard to believe it was ever alive. The Higgins' eye's three to four inch roundish shells, or valves, are golden-olive brown with dark rings and green and orangish rays. Shell interior is coated with white or pink mother-of-pearl, or nacre. The clam's hinged edge is swollen. The unhinged edge is squared in females and pointed in males. The shell is made of calcium like our fingernails, protecting the fleshy animal inside.

The soft mussel has a single "foot" which carries it only a few hundred yards during its potential 30-year life span. Clams embed themselves partly open, hinged end up, in river-bottom clam beds. One siphon takes in food and water while an output siphon releases wastes downstream.

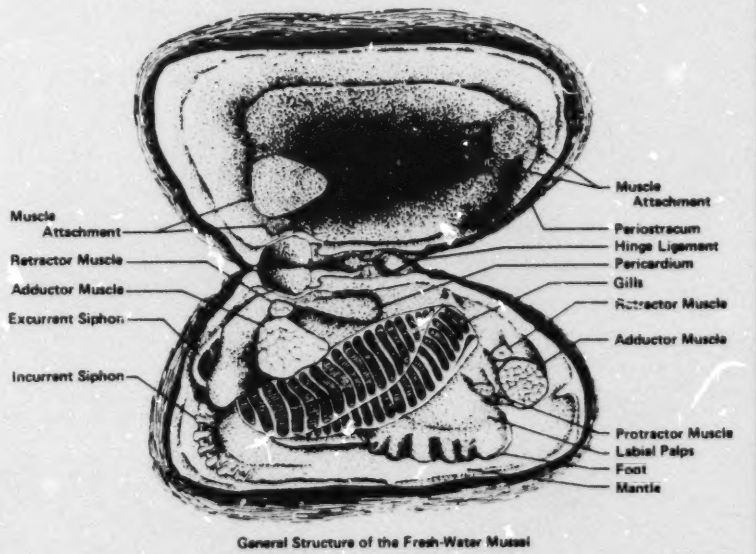
The Higgins' eye is a deep water clam of fast currents in larger rivers. Natural clam predators include muskrats, otters, raccoons, minks, and some fishes and birds. The soft insides of some clams are used as fish bait.

Clam reproduction dramatizes the meaning of the term "ecological relationship." The multi-staged process begins when the male clam emits sperm into the water. With favorable currents, the male sex cells are taken into a female's respiratory gills, which double as brood pouches during the clam's breeding seasons. Fertilized eggs develop into embryo clams called glochidia (glo-kid-e-ah). The female expels these mini-clams into the water when a fish gets in range. Some clams such as the Higgins' eye expose a fleshy mantle outside their shell that has a faint image of a fish that will attract the host fish species.

Higgins' eye ecology is not completely known, but evidence suggests that the sauger *(Stizostedron canadense)* and freshwater drum *(Aplodinotus grunniens)* are its host species. A sauger taken early in the century had 600 Higgins' eye glochidia on its gills. When the host fish approaches, the glochidia are jetted into the water. If the fish reads its cue right, it swallows the blast of embryo clams. The glochidia migrate to the fish's gills and embed themselves. Although this is a parasitic stage in the clam's life cycle, it doesn't seem to harm the fish. The glochidia develop internally but grow little while on the fish. If all goes well, within a week to a month the young clams are ready to drop off and live on their own, hopefully landing near suitable habitat.

Studies suggest that some clam species may have only one host fish species, while other clams have several. A single fish species may be host to several different kinds of clams. One freshwater clam has a salamander host! It's baffling to think how closely clam and host must have evolved!

This mode of reproduction works, but it is chancy and inefficient. Only



General Structure of the Fresh-Water Mussel

Higgins' eye pearly mussel Cont'd.

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a fraction of the glochidia produced reaches maturity. Ecologically, it's a bad move for any creature to be totally dependent on another species for survival. Loss of the hosts could mean loss of the clams. For example, the many dams up and down the Mississippi River led to the disappearance of the skipjack herring and could eventually mean the loss of the elephant ear and ebony shell mussels.

Although never considered a gourmet delight, freshwater clams have a history of economic value. Indians used clam shells for jewelry and tools such as spades, spoons, hoes and single-edged razors.

In 1887, German immigrant J.F. Boeppie fathered what became a multi-million dollar pearl button industry on the upper Mississippi. Within thirty years, 200 U.S. plants were manufacturing pearl buttons, stamping and polishing them from the valves of 40-60,000 tons of freshwater clams every year. The Higgins' eye clam was considered a good button shell because of its thick valves, but was never as industrially important as the more common ebony shell. After World War II, the advent of plastic buttons wiped out the pearl button industry. The last plants closed in the 1960s.

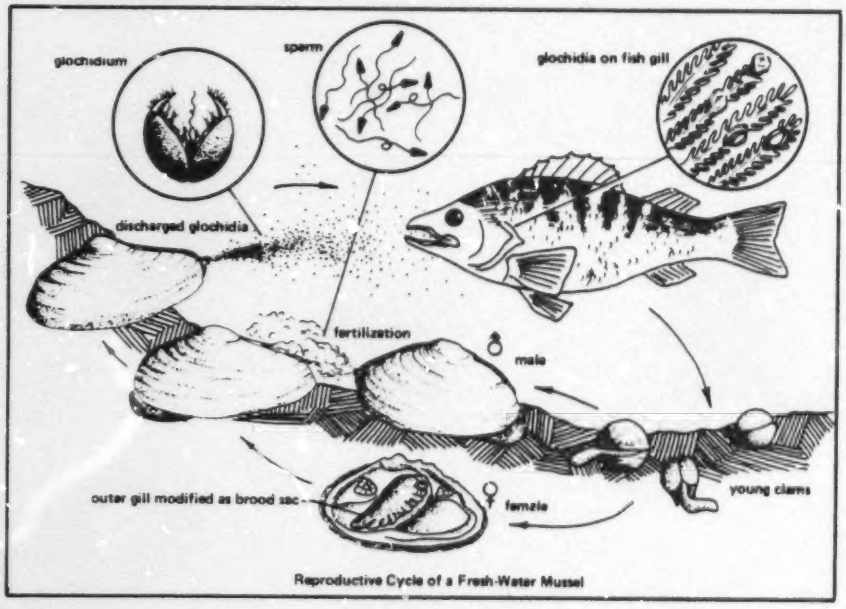
Clam harvesting has its own vernacular. Clammers or clam fishermen (not "musselmen") sail currents rather than breezes, using underwater canvas sails called "mules" in wooden, flat-bottomed "johnboats." A 20-foot "crowfoot" bar armed with chains three inches apart and a fray of solder-tipped strands or three-prong hooks is dragged downcurrent over clambeds. When thus disturbed, the mussel's simple tactile response is to clamp on. When the bar is full, it is hauled up and the clams removed, sorted and bagged.

A new demand for freshwater clams has clammers in the Prairie du Chien area back in their johnboats, harvesting bivalves. Japan, while not seeking the occasional natural pearl formed by clams, uses pellets made from ground clam shells to seed oysters and thus culture pearls. A pearl, cultured or natural, is no more than a mother-of-pearl coating over a foreign particle or piece of grit.

Clamming techniques have changed very little since the pearl button was in vogue. Today, clammers make an effort to throw back any Higgins' eye clams they hook. However, clams aren't likely to survive unless carefully repositioned in the bed. More and more these days, mussel fishing is done by scuba divers specially trained to collect only certain species and sizes of clams. According to some mussel specialists, called malacologists, the fishermen do little harm to clam populations compared to the damage wrought by dams, dredging, pollution and misguided human priorities.

Clams are filter feeders living on a diet of microorganisms gleaned from rich currents. Dams may slow river currents so water is not adequately mixed and enriched. Clams also tend to store pesticides and heavy metals (zinc, copper and mercury), making clam shells natural records of the pollutants in our waterways. Clams are also vulnerable to dredging and waterway traffic, which can bury a clam bed in silt. Silt also clouds the water, cutting down light penetration and production of microorganisms, the clams' diet.

Surprisingly, the meek Higgins' eye pearly mussel is among the most controversial of Wisconsin's endangered species. Because the Higgins' eye depends on the water quality of its limited habitat, several Mississippi River development projects have been delayed due to needed clam impact studies. Some people wonder what the world has come to when a $40 million bridge is held up for a clam. Others pass it off as bureaucratic hilarity or overkill by a bunch of screaming environmentalists. Certainly preserving endangered species cannot be argued in dollars and cents, but many people now realize that these don't have to be "either-or" issues. Moving a clam bed or choosing a new building site are possibilities which need exploring. We can then be assured of knowledgeable, long-range choices which bring us closer to living in harmony with all of earth's creatures. Even a clam.



Reproductive Cycle of a Fresh-Water Mussel

Text by: Inga Brynildson
Drawings by: Georgine Price and Jim McEvoy
Layout by: Beth Quade

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life tracks

Piping plover

(Charadrius melodus)

General breeding range

Animals have evolved many strategies for survival. The osprey and peregrine falcon are master predators. Porcupines guard themselves with sharp quills and skunks with odor. The monarch butterfly avoids attack by being showy and tasting bitter to predators, while the viceroy mimics the monarch's appearance. But for a seven-inch-long, two-ounce shorebird that feeds on clams, fly larvae and beetles, the best survival strategy is not to be seen at all.

Camouflage is the name of the game for piping plovers in all stages of their lifecycle. They inhabit high, outer, dry sand beaches where someone once remarked they "disappear the moment they stop (moving)." The adult has a dry-sand-colored back, white front, orange beak with black tip, and a black brow band and collar. As it grows older, up to eleven years, these bands darken and fill in. Chicks are similar, only downy and without the black markings of the parents. Even the eggs are sand colored with dark splotches. The nest is barely there, a shallow sand scrape with bits of shells and pebbles.

Behavior is equally inconspicuous. Piping plovers may swoop onto a beach in pairs or more, but quickly split and run separate ways making them hard to spot. Scanning the beach for insects and crustaceans, they have the same deliberate movements as a robin listening for earthworms—run, pause, head tilt, peck, run, pause . . .

Even when numerous, piping plovers nest hundreds of feet apart. Male pipers often scratch phony 'cock nests" on the surrounding beach which may confuse predators. During the four-week incubation, parents take turns sitting on their four eggs. Once hatched, chicks stay in the nest just long enough to dry. Then they're off and running. They stay within 500 feet of the nest but don't return to it. Scattering nests and young insures against predators finding and destroying the whole lot.

Although newborn chicks can run and swim, they can't fly until at least a month old. When in danger, they rely on protective coloration and play dead. If a chick runs from an intruder, its parents knock the chick down and get it to lie still. Besides courting, the only time piping plovers draw attention to themselves is when attempting to distract predators from eggs or young. Like its relative the killdeer, at the sight of an intruder a piping plover parent rushes a safe distance from the nest and pretends to be injured. It drags a wing and pushes itself along the beach with its feet. By looking like easy prey, it gradually leads the predator away from nest or young. If these efforts are in vain and the clutch is destroyed, a breeding pair may lay a second one that season but not in the same nest.

Piping plovers get their common name "piping" and their species name "melodus" from their two-noted, organ-like, low song. Pipers range throughout eastern North America, arriving in Wisconsin in late April. In September, they lose their dark bands and fly to the Gulf to overwinter.

Of the 380 species of birds resident in Wisconsin, the piping plover is probably the rarest. In the 1800 's it nested sparingly along the Great Lakes and favorable inland lakes like Koshkonong. The last one on Wisconsin's Lake Michigan shore was recorded in 1948 at a Door County site. In 1978, only one nest and its four eggs was found at Chequamegon Bay on Lake Superior.

The endangered status in Wisconsin is self-evident but to make matters worse, there are also grim reports of very few nests in Ontario, Michigan, Minnesota and Iowa. Atlantic coastal populations have also declined. Florida, a favorite wintering ground, reports very few hundred there in recent years. The National Audubon Society includes the piping plover on its "Blue List" of rare American Birds.

In the 1800's piping plovers were shot for food. On the east coast, there were both spring and autumn piper shoots. This lowered populations to critical levels by the turn of the century. Today the biggest threat is habitat destruction. Shoreline is in demand for recreation and development. Lake front homes and resorts, roaming pets, and off road vehicles take their toll. In 1974, researchers studying Wisconsin's piping plovers noted, "At the time of our visits, the tracks from motor bikes and other vehicles ran over all areas of sand."

Human disturbance has a more subtle effect, too. Gulls, crows, opossums and raccoons fill new habitats in disturbed beach environments. Prey species like the piping plover get hit hard. The ring-billed gull has become especially threatening on the Great Lakes by crowding pipers out of traditional nesting spots. The barren, dry sand

Misuse of off-road vehicles, and pet dogs running loose on beaches seriously disturb piping plover nest habitat in Wisconsin.

Piping plover Cont'd

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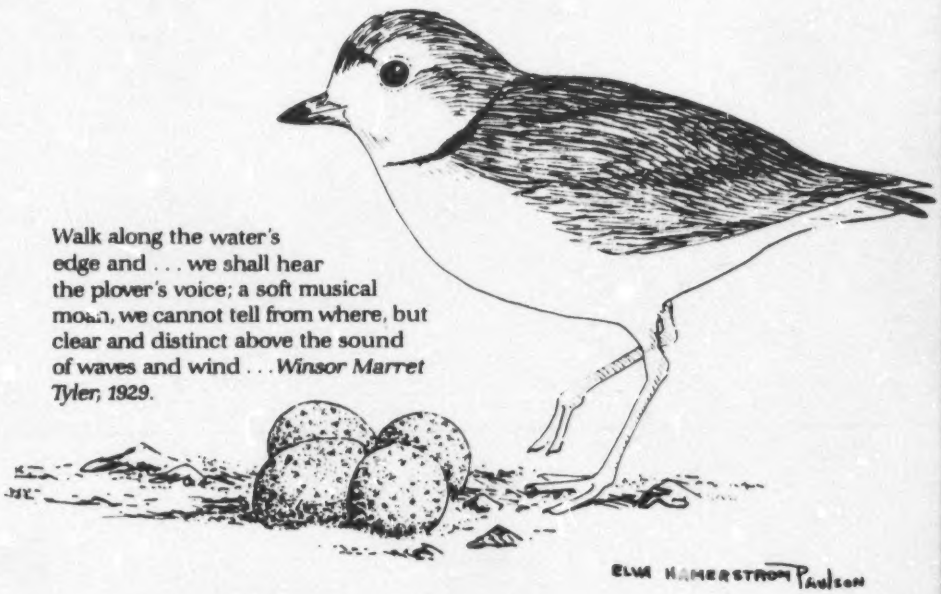
flats plover nests require are changed by rising water level and emergence of grass and brush.

DNR keeps a close eye on traditional piping plover nest sites and records observations. One is at Barker's Island in the St. Louis River in Douglas County. Artificially constructed of dredge-fill, it supported several piping plover nests during the 1960's. The City of Superior plans to develop the island into a city marina. Plans include a 14-acre bird sanctuary for piping plovers and common terns, another endangered species. The city will fence out people, pets and vehicles. Grass and brush will also be cleared from the sanctuary beaches.

The piping plover is one of the most sensitive shorebirds to environmental change. Whether or not it responds to the habitat protection Wisconsin has planned for it could indicate future survival trends among other shorebirds in Wisconsin.

by: Inga Brynildson



Walk along the water's edge and . . . we shall hear the plover's voice; a soft musical moan, we cannot tell from where, but clear and distinct above the sound of waves and wind . . . *Winsor Marret Tyler, 1929.*

life tracks

Osprey

(*Pandion haliaetus*)

General breeding range

The osprey is found everywhere except on the arctic continents. It is brown and white and locked into a fish diet by evolution. Often called "fish hawk," it even comes equipped with little spikes on the bottom of its feet to hold slippery prey. The name osprey is from an old French word that means bonebreaker. Like most predatory birds these days, it is the victim of a science-fiction-like pesticide wipeout. Loss of nesting habitat hurts severely. Pesticides devastate.

In the late 1950's and early 1960's ospreys began to disappear from the east coast. This coincided with heavy use of organochloride pesticides like DDT, dieldrin, endrin, heptachlor, and chlordane. These so-called "hard" pesticides weaken the eggshells of many predator birds. The eggs simply break before they can hatch.

Hard pesticides do not break down rapidly but persist in the environment at low, toxic levels. They build up at each link in the food chain from plant to herbivore to carnivore. Thus, a predator like the osprey—a secondary carnivore that eats other carnivores—poisons itself as it feeds. The requiem is written not in numbers of adults killed, but in empty nests, thin-shelled eggs that never hatch and inability of birds to reproduce.

Wisconsin banned DDT in 1970. The U.S. government outlawed DDT and its close kin in 1972. By 1975 both inland and coastal osprey were showing increased productivity. In Wisconsin, production more than doubled—from a low of 54 in 1973 to 129 by 1978.

But let's not count our ospreys before they hatch. In South and Central America where Wisconsin ospreys spend the winter, hard pesticides are still heavily used to fight insects that carry malaria or destroy crops. The pesticide dose they are exposed to there is heavier than ever encountered in the U.S. It's possible that osprey increases come from protection of nesting sites, not shelter from pesticides.

Ospreys live on fish. Their migrations follow the upriver runs of

alewives and herring. Suckers, perch, and carp are common freshwater prey. Because of this, ospreys nest near lakes and streams —in Wisconsin along waterways in the northern third of the state. Although some birds build almost at water level, more often they choose the highest point on the landscape—lone dead trees and even windmills, utility poles and fire towers.

From the vantage of an apex nest the osprey can easily scout waters below for prey. But wind speeds pick up over bodies of water and the 200 pound nests are often wind thrown. Forestry practices that glean dead trees along with timber can rob ospreys of nesting sites. Lake-front homes, resorts and motorboats are also disruptive. One of Wisconsin's best osprey colonies on the Rainbow Flowage in Oneida County had 25 nests in 1951. By 1977 only one remained.

When an osprey nest structure is destroyed, DNR wildlife managers build a replacement. Three-foot diameter wooden platforms are bolted to utility poles and erected nearby.

In 1977 when a tornado-like downburst smashed through prime nesting habitat in northwestern Wisconsin these artificial structures came to the rescue and in 1978, 19 of Wisconsin's 126 active osprey nests were built on artificial platforms. The best news is that platform nests show even higher success rates than those built on natural structures.

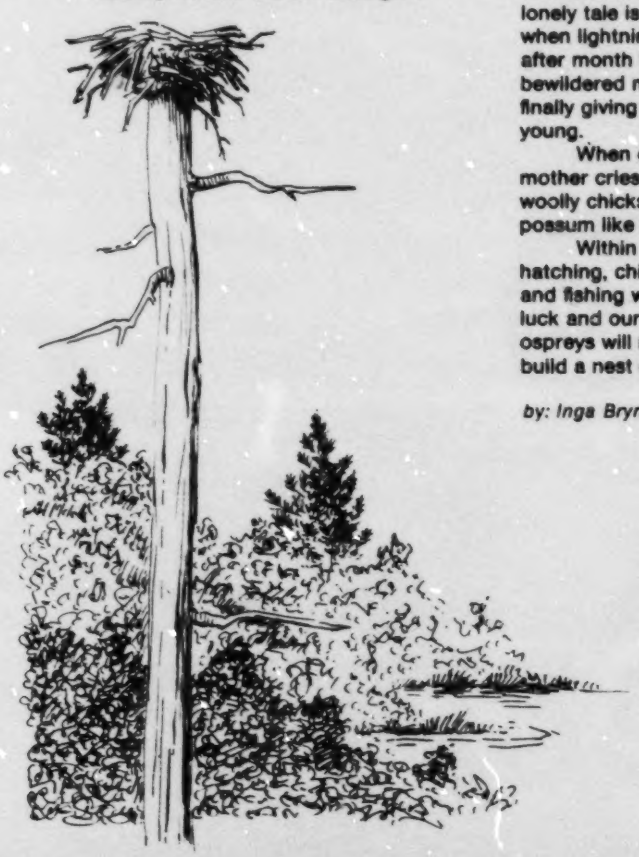
Nearly all osprey chicks that hatch in Wisconsin return to mate when they are two years old. But they don't actually breed until the third year. Ospreys are known for their wild, aerial courtship displays. Often several mating pairs will join together in tail-spinning chases. This can be quite a sight considering that ospreys may reach two feet long and have five-foot wingspans.

When the female is on the nest the male stands guard nearby. One lonely tale is told of a female killed when lightning struck the nest. Month after month for two summers the bewildered male stood watch before finally giving up on his lost mate and young.

When danger threatens, the mother cries out a warning and the woolly chicks go limp. They can play possum like this for hours.

Within two months after hatching, chicks are off alone, flying and fishing without their parents. With luck and our protection, the young ospreys will return in a few years to build a nest of their own.

by: Inga Brynildson



life tracks

Double-crested cormorant

(Phalacrocorax auritus auritus)

General breeding range

What's orange and blue and black all over? If you answered "snag," "water-turkey," "Fountain-City goose" or "crow duck" you're right. They're all nicknames for the double-crested cormorant whose black, four-pound body resembles a jumble of birds. However, a small, orange throat pouch reveals it's really a close relative of the pelican. Other distinguishing features: nostrils on its long, hooked bill are not functional; the inside of its mouth is bright blue; it has two feathery crests on its head; all four toes are webbed (only the front three toes are webbed on swans, geese and ducks).

There are four subspecies. Double-crested cormorants from Wisconsin seasonally range throughout eastern North America with concentrations on Canada's prairies. In spring, flocks from the south and Gulf Coast breed in northern U.S. and Canada.

Until recently cormorants existed in huge numbers. In Wisconsin a spring flock of 2,000 was reported in Adams County in 1947. In the fall of 1949 more than 5,000 migrated through La Crosse County. In 1891 a single Minnesota flock stretched four miles and was 1½ miles wide.

With these populations nobody foresaw that by the 1970's the double-crested cormorant would be endangered in Wisconsin.

Where did they all go? By now it's a too familiar, sad story: Pesticides like DDT are stored in fatty tissue of fish—cormorants eat fish—pesticides build up in cormorants—and the end is broken eggs instead of healthy chicks. Although DDT has now been banned it may take years for our waters to recover.

Cormorants are famed as fishers. One of the best diving birds, they can go down 120 feet and stay under water 80 seconds. In the Far East they have been leashed and used to help people catch fish ever since 600 A.D. This prowess has caused them trouble. In some times and places commercial and sport fishermen have wanted them wiped out as competition. It's a mistaken view. Repeated studies show cormorants actually benefit the industry by eating sculpin, cunner, eels, suckers, bullheads, carp and other species that compete with valuable catches.

Nevertheless, spring cormorant shoots were once a sporting event throughout much of mid-America. In the early 1900's the young were used as dog food. Thousands of chicks were barrelled and shipped. Some colonies lost practically all nestlings every year. As recently as the 1960's colonies were found with all the young shot and nests tipped into the water.

This kind of pressure hurt even more when nesting sites became scarce. In Wisconsin the double-crested cormorant almost disappeared.

In their heyday, colonies of 1,500 breeding pairs were common. Great blue herons and blackcrowned night herons often bunked in too, using old cormorant nests. Nests are made of grass, twigs, reeds and seaweed on

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rock ledges and trees above water. In Wisconsin, colonies are most often built on snags or dead trees. But freezing, thawing and changing water level can wash out traditional trees and leave birds homeless.

This trend was especially apparent at the George Mead Wildlife Area. It had only 20 active nests in 1973. The following year, through a study by UW-Stevens Point it was learned that wood nesting platforms attached to treated poles are a good substitute for nesting trees. Three years later, 31 of 51 nests at Mead were on platforms. DNR has now erected more than 200 platform structures amidst five of the six known active cormorant rookeries in the state. Nests are increasing in number each year.

Nesting takes place from late April to early August. Newly hatched cormorant chicks have been said to look like black "rubber toys" and "animated, greasy rubber bags." They feed by stuffing their heads down the parent's throat for regurgitated fish. The naked chicks are extremely vulnerable to heat, cold and predation. If startled, adults have been known to kick both eggs and chicks out of the nest. Because of this, rookery visits should be delayed until late summer when the young are ready to fledge.

by: Inga Brynildson

life tracks

Peregrine falcon

(Falco peregrinus)

Migrant observations

In the business of ecology the peregrine falcon, or duck hawk, was once a tycoon. As a species, it had security—in distribution, habitat, niche, diet, adaptations, and back-up supplies.

Until the middle of this century, the peregrine was cosmopolitan. The word peregrine means wanderer and it was found everywhere except Antarctica, New Zealand and Iceland (good move for a species that wants to out-last local ecological change!) And to doubly ensure chances for survival it occupied many different plant-climate communities or biomes. In its heyday the peregrine was found in all North American biomes except grasslands.

Used for hunting since ancient times, the female or "falcon" weighs about two pounds and is 20 inches long while the male or "tiercel" is about a third smaller. Tiercel means third. Peregrines hunt from great heights above open fields and riverbeds. Efficient predators, they pack their weight into a streamlined body and armed with a stout, notched beak and piercing talons can hurl through the sky at speeds up to 200 miles per hour. The impact alone will kill ducks and pigeons. "Bullet hawk" is a nickname for the peregrine. After the divebombing stoop, when the prey is hit and stunned, the peregrine swoops back around to catch it in mid-air, a true "Red Baron" of birds. Indeed the curved, dark cheekbands and yellow eye-rings mimick the helmet and goggles of early pilots. As an ace flyer the bird also covers record distances. Many sailors told of peregrines boarding ship 800 miles out to sea.

Besides ducks and pigeons other prey include ruffed grouse, flickers, blue jays, kingfishers, nighthawks, robins, sparrows, green herons, black ducks, mallards and teal, to name a few. A wide ranging diet like this can also pad chances for survival and population growth.

Peregrines have a long association with people. Nomads of central Asia launched the sport of falconry with them 3,000 years ago Then came egg collectors. Lucky for the peregrine, it lays a second clutch if the first is disturbed. Pigeon fanciers were the next threat. They killed peregrines wholesale during World War II but even this had little impact. There was a large population and the bird was used to living with human disturbance. Some peregrines even give up their cliff nests for a skyscraper. Usually they seek the isolation of towering cliff ledges where they dig out shallow grooves and lay four russet and white eggs. The most famous city-dwelling peregrine, the "Sun Life Falcon," nested for 16 seasons on Montreal's Sun Life Building. From this urban eyrie, it reared 21 young.

By every measure the peregrine was in the ecological winner's circle. If it had been a horse, people would have bet on it. But in the late 1940's the peregrine took a nosedive and couldn't pull out. Local explanations—drought, falconers, egg collectors, raccoons—couldn't explain why peregrines were disappearing around the world. By early 1960 they were gone from the east and only a few dozen remained in the west. In Wisconsin, the last breeding peregrines were reported in 1962.

Then came a breakthrough. Almost by accident, a photo was taken of a falcon breaking eggs as she incubated them. The perceptive photographer compared the broken shells to those from old collections. In 1946 alone shell thickness dropped 20%. It was the time of the post-war boom in use of DDT. The

more DDT residue in a female, the thinner her shells. The more broken eggs, the fewer chicks to grow. This was the first link of pesticides to species decline. Since then, the story has become all too familiar for birds like eagles, ospreys and herons.

Fortunately the story doesn't end there. Since 1972, the year DDT was banned in the United States, Cornell University researchers have been breeding peregrines in captivity. By swiping the first clutch of eggs adult peregrines can be prompted to lay a second and even a third clutch. Incubated artificially, eggs from only 40 breeding pairs can produce as many offspring as the original east coast population had produced in the wild.

The next trick is to put the young ones back in the old habitat. Gradual releases using a falconry technique called "hacking," have been tried in several states including Wisconsin. In hacking, scientists provide food and roosts until the bird learns to support itself in the wild. In 1976 and '77, eight peregrines were released on the Mississippi River bluffs in southern Wisconsin. Of these, only two took and even those birds are now missing. Others were eaten by great horned owls or lost. Releases elsewhere have been more encouraging. Thanks to the Cornell program in 1979 the first peregrine pair in 16 years bred on the east coast. Unfortunately, the eggs were infertile, but future ones may not be. Researchers predict it will take at least 15 years of successful restocking before the peregrine falcon can regain ecological prosperity.

by: Inga Brynildson

life tracks

Bald eagle

(Haliaeetus leucocephalus)

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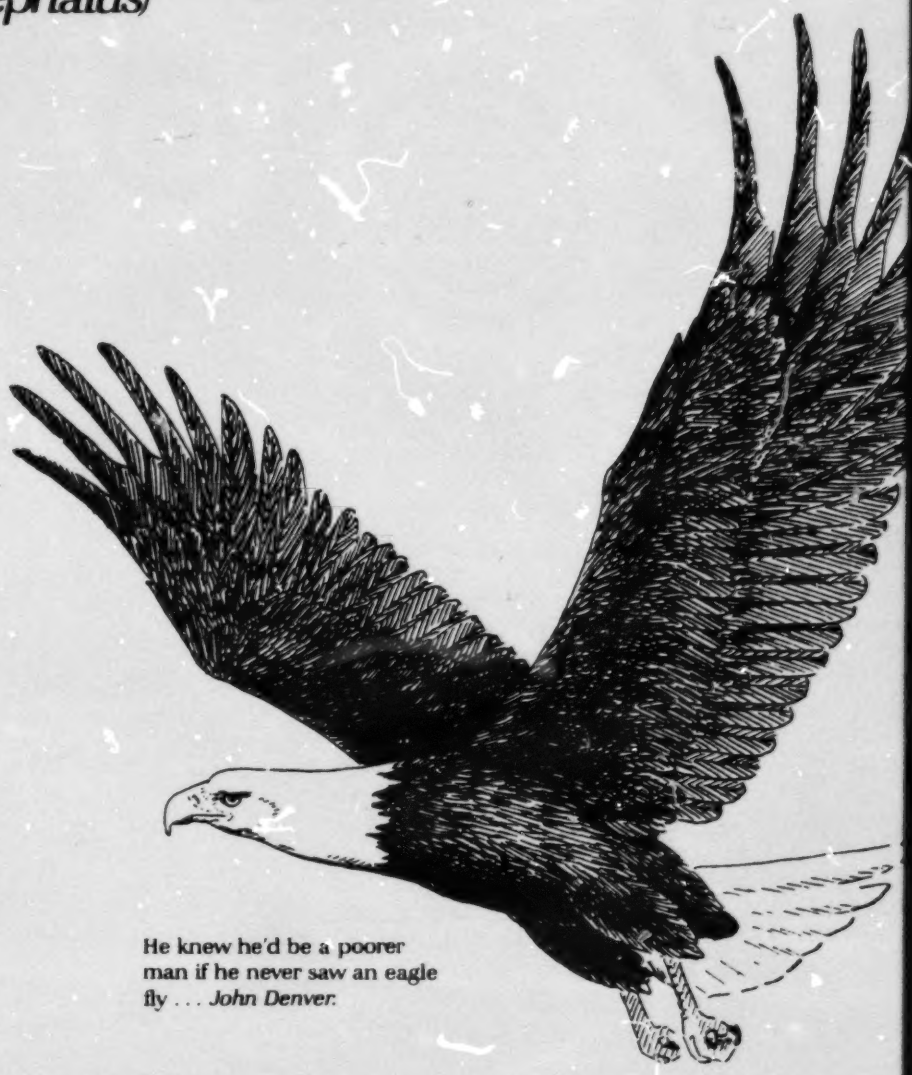
The bald eagle was adopted as our national emblem in 1782. By 1976, our Bicentennial, its existence was "endangered" in 43 states and "threatened" in five. Loss of habitat, pesticides and shooting caused the decline.

Before human settlement, bald eagles nested along waterways throughout Wisconsin. But logging, agriculture and summer resorts drove the birds from traditional nesting haunts. What's left is the territory around inland lakes and rivers in the northern third of the state and some places on the Great Lakes. However, Great Lakes birds are "'ifly," and have had nesting failures in recent years.

In Wisconsin fish is the staple food in the eagle's diet and the inland lakes are relatively uncontaminated. When eagles feed repeatedly on fish that collect toxicants, the poisons add up until harmful amounts are stored in the body fat. In times of stress when these reserves are called on for breeding, nesting and laying eggs, accumulated poisons are released into the bird's bloodstream. Thin-shelled eggs that crack and break are the result. Embryos may not develop properly, or fertilization may be blocked.

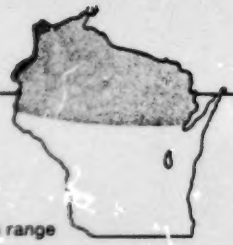
Dieldrin, PCB's, DDT and its derivatives, and possibly heavy metals cause the trouble. These persistent chemicals are now banned but their residues still reverberate.

A lot of eagles die of old age and associated causes. For those that do..t, shooting takes the heaviest toll. It accounts for 50% of the annual deaths despite the threat of a $5,000 fine and a year in prison. Often mistaken for other birds, bald eagles do not don their distinctive white heads and tails until age four. Until then, they resemble big, brown hawks (which may not be legally shot either!). Some people deliberately kill eagles because they hate all birds of prey.



He knew he'd be a poorer man if he never saw an eagle fly . . . *John Denver.*

Bald eagles mate for life, which may be as long as 50 years! They breed early in Wisconsin and around February begin their cartwheeling acts of courtship. Typically, they nest in tall pines or high on rock cliffs. It takes about a week for a mating pair to shape hundreds of boughs into a suitable "eyrie." This is no small task. One record eagle nest weighed two tons! Usually they return to the same



General breeding range

nest year after year and in Wisconsin several nesting territories have been occupied for 40 or 50 years. One eyrie in Sawyer County has been used since 1918—more than 60 years. Occasionally a nesting pair will have two or more nests and rotate between them in different years. When the weight of the nest finally breaks a tree, the nest is abandoned. Windstorm and lightning also take a certain toll of nest trees.

Nesting eagles should be left alone. If disturbed they may give it up for the season. Hiking, snowmobiling and other recreational activities need to be well away from any nest tree.

If all goes well, one to three chalky-white eggs are laid by early April and hatch about 35 days later. From then on there's not a moment's rest. Eaglets grow from three inches to 36 inches in 12 weeks and it means hauling a lot of food!

The bald eagle has been on Wisconsin's endangered list since 1972 but the federal list carries it as only "threatened" here. "Threatened" means in trouble but not as bad as "endangered." The federal classification came after several successful breeding seasons slowed the long-time eagle nose dive in Wisconsin.

Wisconsin's population now appears to be holding its own. In 1978 we had 140 active nests in our northern forests. These sites must be closely watched if populations are to remain stable or to grow. A National Wildlife Federation census taken in January, 1979 tallied 9,836 eagles in the lower 48 states. Of these, perhaps half were year around residents. In all there were about 1,200 breeding pairs.

Today the Endangered Species Act and the Bald Eagle Protection Act of 1940 ensure protection of all bald eagles within the continental United States.

In Wisconsin, DNR and the U.S. Forest Service have adopted management practices to help slow loss of nesting habitat and identify replacement sites for disturbed nests. Timber cutting, road construction and other disruptive activities are prohibited within 10 chains (660 feet) of a nest tree between March 1 and August 1. Three to five large trees are saved for roosting and nesting within this zone. Some smaller trees are also saved to take over as the old ones die off. These practices will ensure a long-range supply of nest trees. Land-owners whose private properties contain eagle nests are being asked to provide similar protection.

This management, accompanied by strict pesticide control and obedience to protective laws will help save the bald eagle from extirpation. It's a threefold program and it's the least we can do.

by: Inga Brynildson

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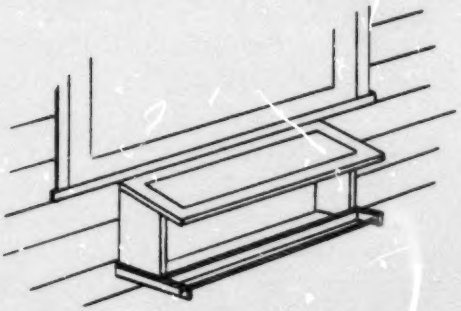
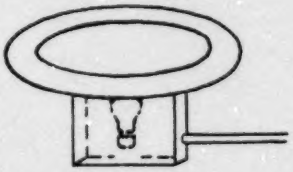
SONG BIRD FEEDERS



WINTER FEEDER WITH GLASS ROOF
(Roof also hinged)

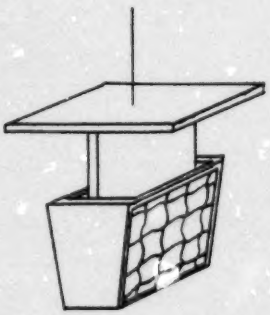
The woodpeckers, nuthatches, chickadees, and creepers may be fed from nearly any kind of feeder, but they come more quickly to those attached to trees. All birds feed rather close to the ground, but cardinals, other grosbeaks, jays and the tree-loving species will come to elevated feeders if they are not placed extremely high. The juncos, tree sparrows and redpolls prefer to feed on the ground, and small patches swept clean of snow may be used if cats and other enemies are not a problem.



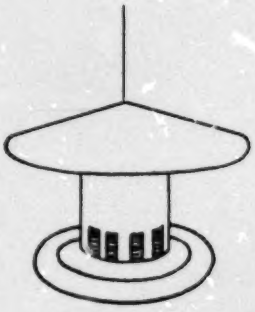
WINTER DRINKING DEVICE

Many species which cannot be attracted easily with food will respond if drinking water is supplied when natural water is frozen. In fact, all species need drinking water in winter. A small pan can be kept unfrozen in sub-zero temperatures with the use of a small lightbulb. The electrical device should be constructed so that it will pass inspection from a safety angle, however, (water should not come into contact with the wires, etc.). Other devices for warming water such as those used by chicken farmers are available for less than ten dollars.

Many people feed song birds in winter to keep them near their homes. Others feed them because they like to help our valuable species at a time when natural foods are scarce. If feeding is begun, it should be continued throughout the season of shortage because the birds will begin to rely upon your supply.



SUET FEEDER*



GRAIN FEEDER

SUET AND GRAIN *(MIXED)* FEEDER

* *Wire mesh should not be used as it may freeze the bird's eyes upon contact in cold weather.*

KINDS OF FOOD

Suet is the most popular. It appeals to the woodpeckers, nuthatches, chickadees, creepers, and many other species. Ground meat also may be used. Sunflower seeds perhaps are the next in importance. The species mentioned above will eat them and they will attract grosbeaks and finches. Dried fruits will attract insectivorous birds. Chopped nut meats are appealing to nearly all species. The seed-eaters, such as juncos, tree-sparrows, etc., will like screenings, and any weed seeds, millet, buckwheat, and other seeds. Pumpkin seeds attract cardinals, and table scraps have a variety of uses. Always put out sand or other grit when the ground is covered with snow or ice.

SUMMER FEEDING

Although birds do not need to be fed in summer, they will bring their families to the feeder if you keep them supplied the year around.

THE SQUIRREL PROBLEM

To eliminate the squirrel problem, stretch a long wire across an open area (like a clothes line) and suspend the feeder from this (out of the reach of tree branches).

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OUR MISSION
To protect and enhance our Natural Resources — our air, land and water; our wildlife, fish and forests.
To provide a clean and abundant out-of-doors and a full range of outdoor opportunities.
To insure the right of all Wisconsin citizens to use and enjoy these resources in their work and leisure.
And, in cooperation with all our citizens to remember the future and those who will follow us.
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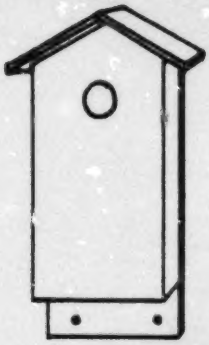
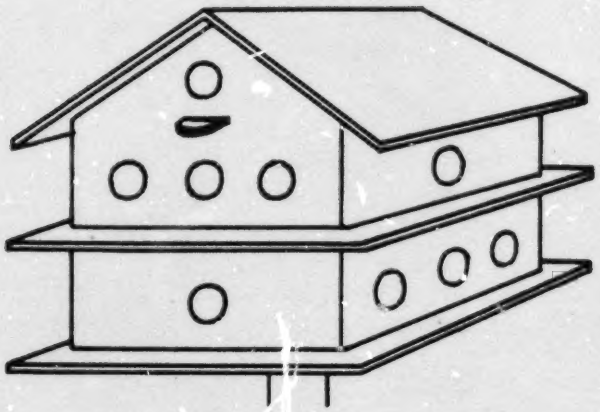


Bluebird House

BIRD HOUSES

BIRD HOUSES MAY BE BUILT EITHER OF RUSTIC MATERIALS OR OF FINISHED LUMBER. METAL SHOULD NOT BE USED AS IT GETS TOO HOT IN SUMMER AND TOO COLD IN WINTER

BLUEBIRD HOUSES SHOULD BE PLACED ABOUT FIVE OR SIX FEET ABOVE THE GROUND IN SEMI-OPEN PLACES EARLY IN APRIL. IT IS BETTER NOT TO PAINT THEM. THE SAME GENERAL STYLE OF HOUSE ALSO WILL ATTRACT TREE SWALLOWS, CRESTED FLYCATCHERS AND OTHER SPECIES WHEN MODIFIED AS INDICATED BELOW.



Martin House

MARTIN HOUSES SHOULD BE LOCATED IN OPEN PLACES AWAY FROM TREES. ENGLISH SPARROWS AND STARLINGS SHOULD BE KEPT OUT. THESE HOUSES MAY BE PAINTED.

KIND OF BIRD	INSIDE FLOOR DIMENSIONS	SIZE OF ENTRANCE	HEIGHT OF ENTRANCE ABOVE FLOOR	GENERAL LOCATION OF HOUSE	HEIGHT ABOVE GROUND	WHEN TO PUT UP
Bluebird	5" x 5"	1½"	8"	Orchard Type	5'-6'	Apr. 1
Tree Swallow	5" x 5"	1½"	5"	In Open	5'-10'	Apr. 1
Crested Flycatcher	6" x 6"	2"	8"	Wooded Areas	10'	May 1
Purple Martin	6" x 6"	2½"	2"	In Open	12'	Apr. 1
House Wren	4" x 4"	1"	3"-5"	Anywhere	6'	Apr. 20
Robin	7" x 7"	-	-	On Wall	10'	Apr. 1

Robin Shelf

ROBIN NEST SHELTERS SHOULD BE PLACED OUT OF THE REACH OF CATS.

Popular Styles of Wren Houses

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Massasauga
(Sistrurus catenatus)

You may not recognize a massasauga, but you probably can imagine the likes of a "swamp rattler." It's in the "pygmy rattlesnake" genus and is the smaller of Wisconsin's two poisonous snakes. The massasauga is two feet to a yard long. Timber rattler's by contrast are usually longer than three feet.

Also nicknamed "black rattlesnake," the massasauga's rich chocolate brown backsaddles and triple rows of side blotches merge with a marbled or solid black belly. Body blotches are edged in white. On the tail they join top to bottom in five to seven cigarband rings around a thick, grayish earthbrown body. The head is flattened and broad. One white and three dark stripes radiate from its face. Nine enlarged plate scales helmet its head. The timber rattler does not have these large plates, but only small, random head scales.

"Massasauga" is the Chippewa for "great river mouth", so named because the snake's home is riverbottom forest and nearby fields. Timber rattlers usually live in the upland.

Wisconsin is in the center of the massasauga's range from central New York and southern Ontario to Iowa and Missouri. Some of the largest populations once thrived in the lower third of Wisconsin. Early settlers of Madison found massasaugas along the Yahara River and where the state capitol now stands. Milwaukee and Racine are also built on former massasauga stamping grounds.

Today the southwestern edge of Wisconsin and Walworth County are the massasauga's last stands. Endangered in Iowa and threatened in Minnesota, it has been proposed as a federal endangered species.

Draining and dredging, the hog pasturing did in its swampwater habitat. While plows and bulldozers took over adjacent fields where it migrates during flooding.

As autumn cools, massasaugas individually hibernate in crayfish and mammal burrows, or sawdust piles. The use of crayfish burrows is especially vital and illustrates an ecological linkage in the web of life, we hear so much about.

Crayfish build riverbottom dugouts with above ground mud chimneys. Massasaugas take over burrows for the winter, hibernating at water level. Since massasaugas cannot build burrows, protection of this snake must also include crayfish.

Massasaugas re-emerge with the spring thaw, anchoring themselves on beaver dams and brush during snowmelt floods. They're out and about in the early morning and also stay active on warm, humid overcast days, sometimes sunning themselves along roads or railroad beds.

Massasaugas mature in two years and may live up to 14. Breeding takes place in spring and fall with young born in August. In pre-mating competition males loop their bodies and raise their heads higher and higher, one trying to out do the other. Odors and a head bobbing ritual are part of courtship.

Massasaugas are viviparous, that is, the young are born alive rather than hatched from eggs. However, a nonfunctional egg tooth suggests that massasaugas evolved from egg layers. Young are born in thin egg sacs from which they escape in minutes. Newborn are the size of a lead pencil and could coil on a silver dollar. Eight to 20 are born beneath a log, wood pile or rock ledge. A rattlesnake den is said to smell like freshly sliced cucumbers. Young stay in the den about four days while they shed their skin, exposing a "button" rattle.

The infamous rattles are actually modified epidermal scales with a bony core. They are not a measure of age, but rather indicate the number of changes of skin. Depending on health and rate of growth, massasaugas shed three to five times a year, but rattles wear and break off. Rattling is a nervous defensive threat like a dog's growl. It is meant to scare off intruders, prevent encounters and conserve venom. You can be fooled by non-rattlesnakes that shake their tails in dry leaves to bluff predators.

Rattlesnakes decorated Revolutionary War flags with the slogan "Don't Tread on Me." They were thought to represent honor, always warning before striking. Actually, rattlesnakes do not always rattle first. Some rattlesnakes don't even have rattles. The human hunting tactic of listening for a rattle and killing the snake may be increasing the occurrence of rattleless rattlesnakes.

Rattlesnakes strike because their venom must be injected into the bloodstream to be toxic. A three foot snake can strike only about 12 inches. When unused, the massasauga's fangs are rotated backward against the roof of its mouth. Each fang can be moved separately at will. Venom glands and ducts secrete their juice into hollow fangs.

Although drop for drop massasauga venom is more poisonous than the timber rattler's, the snake is small and its bite would probably not cause severe injury to an adult person. Since 1900, when the state started keeping track of such things, there have been no deaths in Wisconsin due to snake bite.

Massasaugas are shy, secretive animals and aren't likely to strike unless molested. If you fear encounters with snakes, wear high hiking boots, walk noisily, know first aid and stay calm if bitten.

Rattlesnakes are "pit vipers," having pits under the eyes which are sensitive heat detectors alerting the snake to prey or intruders. Raccoons, hogs, skunks, foxes, hawks and eagles prey on massasaugas.

Unlike the timber rattlesnake, the massasauga will eat cold-blooded prey like frogs and other snakes, but given a choice prefers mice, voles, shrews and an occasional blackbird.

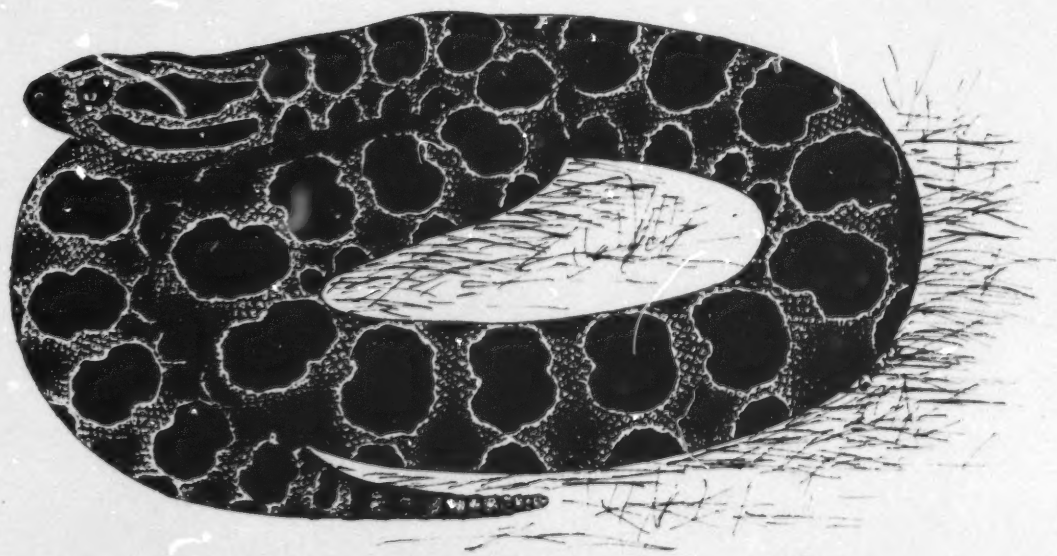
Going through life as a rattlesnake has its drawbacks. Folklore and myth exaggerate their deadliness and cast them as more vicious than they are. "A real snake in the grass," "what a sidewinder," and "lower than a snake's belly" are words to defame character. Music in suspense movies and detective shows pique our fear with the crescendo of a rattlesnake.

Until 1975 rattlesnakes in Wisconsin were worth $5 a tail to bounty hunters. When the bounty was lifted and massasaugas placed on the endangered species list, some people thought DNR had lost its head for sure. Newspapers were full of quotes like: "Who wouldn't want 'em to go extinct?" "Let 'em put 'em on the endangered species list, and they'll get thicker than blue blazes." "I never thought I'd see the day when people wanted to protect rattlesnakes. I don't want to be anywhere near one."

Since 1975 though, rattlesnakes have not multiplied out of control. Timber rattlesnakes are still hunted and sold to biological supply houses. Massasaugas, though protected from hunting, are limited by wetland drainage and human habitation.

While we wouldn't want massasaugas in our gardens, we shouldn't assume that they pose a threat to us in their secluded natural habitats. It seems odd that our society can readily live with mounting tons of hazardous toxic waste chemicals, yet cringe at the meager ecologically contained existence of native venomous snakes. Have we yet, learned to tell environmental good from evil?

by: Inga Brynildson



life tracks

Common tern
(Sterna hirundo)

General breeding range

It's ironic to list a bird named the "common tern" as one of the rarest in the state. But it's not yet the "uncommon tern" either, so there's hope.

The bird has a semi-cosmopolitan range and breeds in parts of North and South America, Europe, Asia and Africa. It winters in their warmer regions.

Tern populations have had a checkered history. During the millinery boom of the late 1800's, the bird was almost wiped out in the western world. Delicate plumes decorated hats and boas. Egg collectors also threatened. And on the East Coast, relentless collectors kept the birds laying like hens all summer. But by century's end, stringent laws restricted these activities. By the early 1940's, the common tern was once again living up to its name.

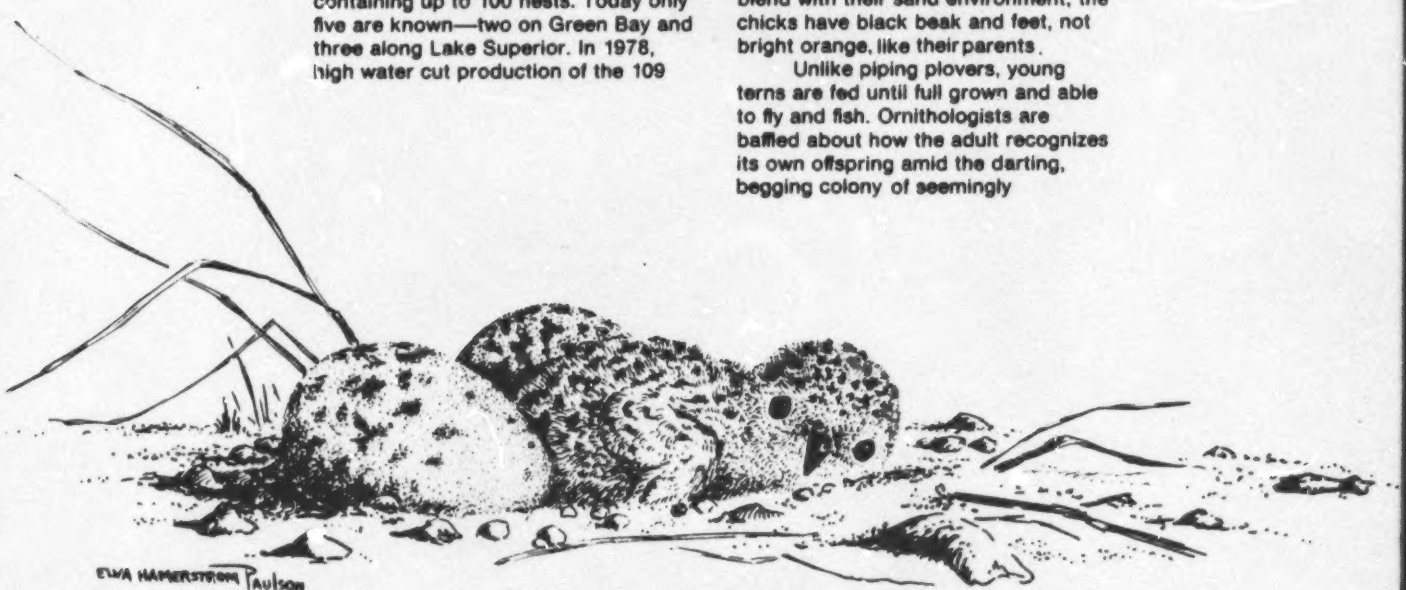
Since then however, North American numbers have nosedived. On the East Coast, only half the population of the 40's is present today. In New England a 1972 census counted a disappointing 9,000 pairs. Since 1960, along Lakes Superior, Michigan and Huron breeding pairs have decreased from 4,990 to 1,691. In Wisconsin, historically there had been 14 colonies with some of them containing up to 100 nests. Today only five are known—two on Green Bay and three along Lake Superior. In 1978, high water cut production of the 109 nests along Green Bay and there were no chicks hatched at all along Lake Superior.

In summer plumage, as we see them in Wisconsin, the common tern is easily confused with Forster's tern, also endangered. The difference between them is subtle. Both have white, 14-inch bodies ending in deeply forked tails. Their gray, sharply angled wings span 2½ feet. Both have orange beaks with a black tip, and black skullcaps extending down the napes of their necks.

Field guides vary on how to tell them apart and unless both birds are present for comparison, features are hard to separate. Probably the most reliable indicator is voice. The common tern, which hardly ever keeps still, repeats a high-pitched "tee-arr-r-r-r." Early ornithologist Arthur C. Bent dubbed this call "the poetry of summer seas." By contrast, he characterized as "harsh, grating cries" the Forster's low-pitched, nasal "shee-e-e-e."

Common terns are gregarious and form large flocks. Like piping plovers, they nest on isolated sand beaches that are almost bare. A colony in early June is a crowded huddle of shallow sand scrapes filled with three to six variously patterned eggs; and 21 days later, chicks. Camouflaged to blend with their sand environment, the chicks have black beak and feet, not bright orange, like their parents.

Unlike piping plovers, young terns are fed until full grown and able to fly and fish. Ornithologists are baffled about how the adult recognizes its own offspring amid the darting, begging colony of seemingly



Identical chicks. Same is true of eggs, even when secretly moved from one nest to another, parents calmly find and settle upon their own.

Small fish, insects and crustaceans are food to common terns. Flocks dizzily hover above schools of fish and one after the other "like birds gone mad" dive for prey. Commercial fishermen know this spectacular sight means fish below.

Common terns have a long-standing feud with herring gulls—preying on enemy chicks. Ring-billed gulls compete with common terns for open nesting ground. Wisconsin's ring-billed gull population is on the rise, and in some places ring-billed gulls have excluded terns from traditional nesting sites.

Common terns are up against an onslaught of environmental change. In some places water pollution and increased fishing pressure have cut back food supply. As fish eaters, they suffer pesticide injury. PCB's,DDT and DDE have caused egg shell thinning and deformed young. A rise of only a few inches in Great Lakes water levels can endanger nesting habitat and mean poor breeding success.

But crowds, pets, shoreline development and off-road vehicles leave little room for a tern to bring young to fledging. To help, the city of Superior has reserved a portion of Barker's Island in the St. Louis River as a bird sanctuary. Through foresighted projects like this the common tern may someday again live up to its name in Wisconsin.

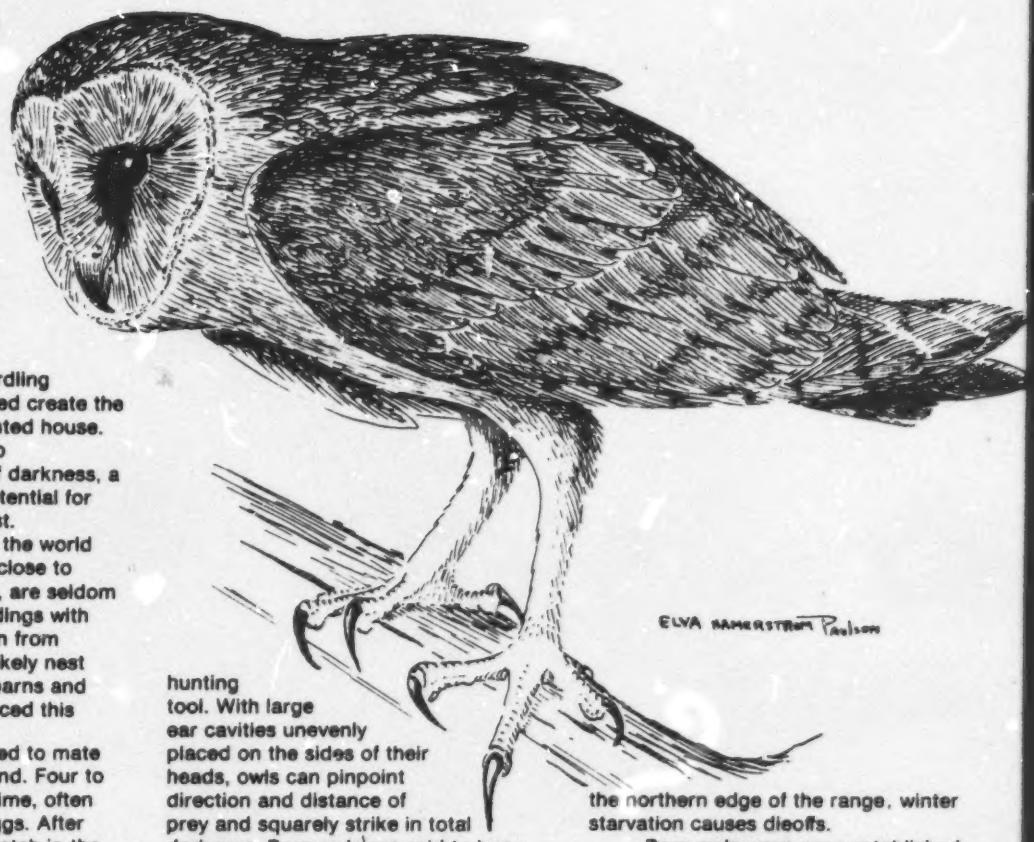
by: Inga Brynildson

life tracks *Wisconsin Office of Endangered and Nongame Species*
Department of Natural Resources

Barn owl

(Tyto alba)

Former breeding range



Because of its white, heart-shaped face disk, the barn owl is known as the monkey-faced or sweetheart owl. Its pale breast and gold wings and back are sprinkled with black poppyseed speckles. Weight is about a pound, and the wings span more than 3½ feet.

A nighttime creature with a spook-white mask, a soundless, moth-like flutter and a blood-curdling scream, the barn owl helped create the ancient legend of the haunted house. Medieval artists chose it to characterize the powers of darkness, a reputation with built in potential for the endangered species list.

Barn owls are found the world over. They commonly live close to people but, active at night, are seldom seen. Neglected rural buildings with easy access and protection from weather and daylight are likely nest spots. But modern metal barns and glass-lined silos have reduced this habitat.

Barn owls are believed to mate for life and breed year round. Four to 12 eggs are laid one at a time, often skipping a day between eggs. After about a month, the eggs hatch in the same staggered order in which they were laid. Owlets in a single nest may vary in age and size by as much as 18 days. The last to hatch is often so small and weak it is trampled and cannibalized by nestmates. A staggered clutch lengthens nursery time. Hungry nestlings keep parents hunting all night for 10 weeks before fledging and for another month after that.

Historically, barn owls have been shot or poisoned in defense of poultry and songbirds. Actually 90% of their diet is made up of small mammals harmful to crops. Called the "living mousetrap," one barn owl is said to be worth a dozen cats. Voles, shrews and rats are also food. Barn owls eat hardly any birds—only one or two percent of their total diet.

Owls are famous for penetrating eyes, but hearing is their most valuable hunting tool. With large ear cavities unevenly placed on the sides of their heads, owls can pinpoint direction and distance of prey and squarely strike in total darkness. Barn owls are said to hear the patter of a mouse running on hard-packed earth at 30 yards or more.

They devour food head-first and whole. Bones, fur, feathers and other undigestibles are regurgitated as compact pellets about 1½ inches long. Two or three are cast each day and contain remains of three to six small prey. They reveal exactly what the bird's been eating, which is about 1½ times its weight daily.

Despite this ravenous appetite, barn owls store the least fat of any owl. When prey are hidden beneath snow this means trouble. In Wisconsin, at the northern edge of the range, winter starvation causes dieoffs.

Barn owls were once established residents of southern Wisconsin but between 1973 and 1977 only nine nests were reported. In 1978, no nests at all were verified by DNR even though a $25 reward was offered. This downward trend exists throughout the Great Lakes Region, but not in southwestern United States.

Hopefully, listing the barn owl as endangered will brighten its future in Wisconsin. The list gives full protection and steps-up chances for management studies. It may also help Wisconsin residents to know the bird and start it on the road to recovery.

by: Inga Brynildson

Wisconsin Dept. of Natural Resources
Office of Endangered and Nongame Species

Pine marten
(Martes americana)

General distribution

The pine marten is an alert, long-bodied member of the weasel family. It has thick, brown fur, shoebutton eyes and a straight, bushy tail that nearly matches its body in length. The pine marten doesn't give a fierce impression. It resembles a round-earred, small house cat and looks rather like a mischievious character in a Saturday morning cartoon. But martens are ambitious hunters and take on animals their own size and larger.

They move with a curious, excitable energy, investigating everything, crossing and criss-crossing their tracks. Usually other animals leave them alone but there are records of infrequent harrassment by red fox, lynx, fisher, eagles and horned owls. Martens live solitary lifestyles in downed logs and tree stump holes. They come out mostly at night.

If you see one you can count yourself lucky. There are not many left. A rare predator in the US they are also disappearing in Canada. Their other common name, "American sable," tells some of the story.

The tawny-brown fur is thick and warm and martens are unsuspicious and easily trapped. Pelts from the Lake Superior region rated second only to those from Canada's far north and martens were eagerly trapped for fur trade. But there was a steady decline in success and Wisconsin finally closed the season in 1921. Although this finally ended 400 years of marten trapping around Lake Superior, it came too late. Intensive logging, fire and agriculture had wrecked the range. The last Wisconsin pine marten was taken in Douglas County in 1925.

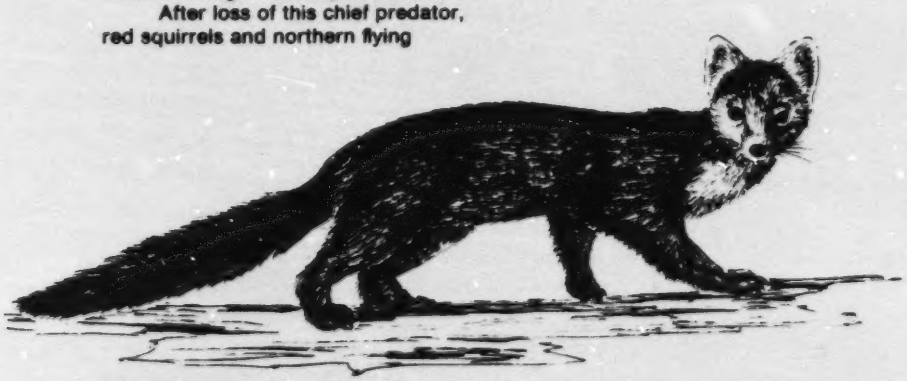
After loss of this chief predator, red squirrels and northern flying squirrels became somewhat pesty and undoubtedly the marten's other major prey—various mice, snowshoe hare and grouse—all increased until nature could re-adjust. Hindsight says we should have known enough to trap fewer martens. We should have recognized the animal's low reproductive rate. They live only six years in the wild and don't even begin to bear young until they are three. The annual litter consists of two to four kits. Or we could blame those who cleared the mature northern forests.

But hindsight may not be all in vain. Today we know enough about marten ecology to try reintroduction. In 1953, five were placed on Stockton Island in Lake Superior's Apostle Island chain. A few years later, five more were released there and an observation in 1972 indicates a small population has survived.

There was a more elaborate restocking in 1975 and '76 when 124 marten were released in the Nicolet National Forest in northeast Wisconsin. A disproportionate number were male and the addition of more females is planned. It's too early to tell how they fared.

Similar programs in Michigan produced disappointing results and there have been other discouraging reports. But in spite of these, wildlife managers are optimistic that if we heed the lessons of the past, the pine marten is one state endangered species that can have a second chance in Wisconsin.

by: Inga Brynildson



INGA BRYNILDSON
Communications Coordinator,
DNR, Bureau of Endangered Resources

WOODCUTTER:
SPARE THAT SNAG

Dead wood. Lumberjacks and backlot woodsmen have a cord of names for it — cull, wolf tree, tinderbox, lightning rod, widowmaker, organ pipe, deadfall and snag. They've all come to mean one thing — pretty much useless. Something that just takes up space and should be cut down. (Got any "dead wood" in your office?)

In lumbering days past, snags were the first to get axed. Nothing but fire traps, insect snares and safety hazards. But foresters have found a "snag" in this old practice. In fact, the US Forest Service now encourages woodlot managers to save old, dead trees. Reason for the about-face is a lesson in forest ecology and economics.

In nature's scheme of waste not — want not, even dead wood is put to work. As a tree dies and decomposes, it may have a series of tenants. Take for example a mid-size oak on the outskirts of a Wisconsin woodlot. First something breaks off a small branch — wind or maybe a tree-climber. Brown creepers nest in the split of the bark. Fungus and insects hollow the injury enough to accommodate white-breasted nuthatches. As the trunk decays, "primary excavators" like red-headed woodpeckers or common flickers go pecking for insects and chisel nest holes.

When that generation leaves, "secondary users" such as grey squirrels, saw-whet owls, raccoons or bluebirds claim the hollow. As the tree becomes limb-bare and stripped of bark, Wisconsin's largest woodpecker, the huge pileated, drills into the standing hull. Once the tree topples, black-capped chickadees dig a nest in the rotted stump. Each generation prepares the way for the next until the log flakes to humus on the forest floor.

And this little snag life-history is by no means complete. At least 85 North American birds are cavity-nesters. A northern Minnesota study counted 11 primary excavators and 23 secondary snag-using birds in forests similar to northern Wisconsin. In addition to birds, 30 mammals plus 13 reptiles and amphibians bring the total to 77 snag-using vertebrates in northern forests. And that's not even counting all the insects these animals eat!

According to the Forest Service, the main thing limiting the number of cavity-nesters is lack of nest trees. Apparently, forest managers have done *too* good a job downing snags. To help save dead trees, in 1977 the service adopted a snag-management policy in national forests to provide habitat for viable, self-sustaining populations of cavity-nesting, snag-dependent wildlife.

The reason Smokey the Bear has taken this sudden interest in his forest friends is economics. Most snag-using birds are also insect-eating birds. According to the US Department of Agriculture, insects destroy a third of the food and wood produced in the US each year. Some insects have become resistant to pesticides. This makes insect-hungry birds like woodpeckers invaluable to foresters.

When bark-gleaning birds forage for bark beetles, termites, carpenter ants, sawflies, spiders and moths, they perform a valuable service. According to the Forest Service, if an insect outbreak strikes forests with healthy bird populations, birds can "buffer, contain or possibly eliminate the insect infestation." The Service notes other benefits too; natural predators cut down the need for costly pesticides, and help solve problems of pesticide resistance and the environmental danger of heavy application.

If the snag goes, so does the woodpecker and other insect-eaters. Long gone are the truly huge, great-granddaddy den trees which housed the likes of peregrine falcons, barn owls and ivory-billed woodpeckers. The red-cockaded woodpecker, today an endangered species in the southern US, was probably once a major predator of the southern pine beetle, a pest that infested 29.5 million forest acres in 1980. If we ever hope to reduce America's pesticide habit, saving the snag should be a crucial part of sensible pest management. But learning to save snags may be one of those "you don't know what you've got 'til it's gone" lessons.

Nowadays, foresters are examining ways to *create* snags. Routing out holes in otherwise healthy trees is one method being tested. Ohio State University researchers are even experimenting with plastic trees. They placed 50 soft-plastic, eight-foot cylinders in woodlots. Within a few months, woodpeckers bored nest holes in 85%.

Most snag- and woodpecker-promoting strategies are more basic:

- Limit the size of clearcuts to 20-40 acres (It takes 20-30 years before a completely cleared stand is once again suitable for woodpeckers).
- Clearcut long, narrow, rather than square strips.
- Leave three to four-foot stumps when cutting trees. This so-called "high stumping" allows cavity nesters to move into what's left.
- Leave woody debris and underbrush in cut areas.
- Construct and attach nest boxes.
- Save snags.

In Chequamegon National Forest, timber managers now preserve at least two snags per acre. And the size of those trees is important too, since snag-users range from tiny chickadees to turkey vultures with 70-inch wingspans. The Chequamegon plan sets a minimum snag diameter of 12 inches at breast height. Generally, the larger the snag, the more species it will accommodate.

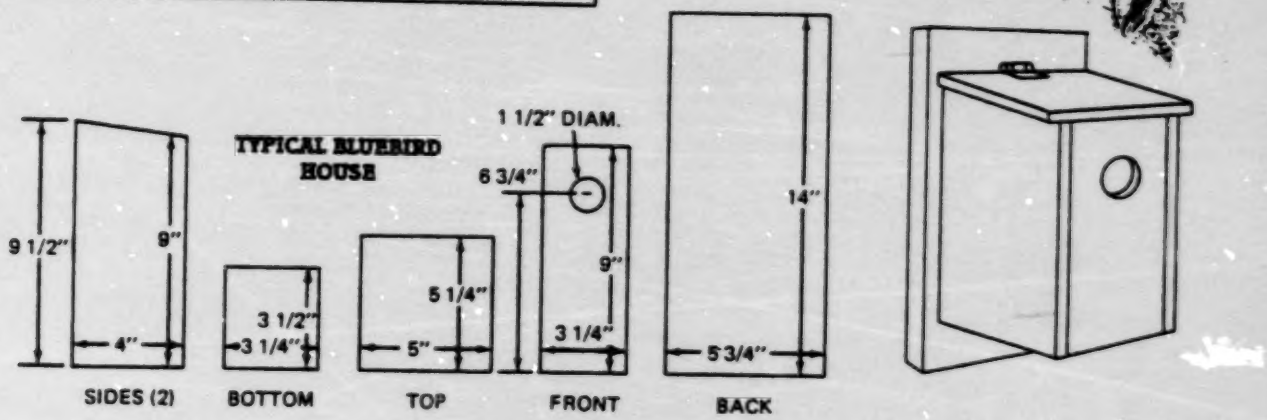
Saving snags is not just for loggers or backwoodsmen. Homeowners should keep in mind that snag-nesting swallows, swifts and purple martins are mosquito-eaters. Plus, if you like to watch birds and small mammals, snag trees (a safe distance from the house) draw them like no manufactured birdhouse ever will. Hang suet bags in winter to fortify the larder for woodpeckers.

With dead wood meaning fuelwood to more and more Wisconsin families, good, dry firewood is at a premium. If you cut wood, check for wildlife nests and dens before you chop. Leave plenty of good-sized snags standing. Cut green wood if necessary and let it dry a year or two. An upcoming DNR research project will examine wildlife use of snags and the impact of fuelwood-cutting on southern Wisconsin woodlots.

Perhaps the Forest Service should add a third mascot to its forest-wise team of Smokey the Bear and Woodsy the Owl. Maybe somebody should nominate Woody Woodpecker. What we need is a little more dead wood around here.

SOME BIRDS THAT USE SNAGS

Hairy woodpecker
Downy woodpecker
Black-backed three-toed woodpecker
Northern three-toed woodpecker
Great crested flycatcher
Tree swallow
Purple martin
Black-capped chickadee
Boreal chickadee
Tufted titmouse
White-breasted nuthatch
Red-breasted nuthatch
Brown creeper
House wren
Winter wren
Eastern bluebird
Prothonotary warbler
Wood duck
Common goldeneye
Hooded merganser
Common merganser
Turkey vulture
Peregrine falcon
American kestrel
Barn owl
Screech owl
Barred owl
Boreal owl
Saw-whet owl
Chimney swift
Common flicker
Pileated woodpecker
Red-headed woodpecker
Yellow-bellied sapsucker



TEN HOLE-NESTERS OF EASTERN WOODLOTS

Species	Length	Excavator	Secondary user	Optimum diameter for snag	Hole diameter	Box Size Length	Box Size Width	Box Size Height	Height above ground	Habitat
	Inches			Inches	Inches		Inches		Feet	
Pileated Woodpecker	15	X		20	4	—	—	—	—	Old growth; large trees; extensive forests
Screech owl	8		X	12	3	8	8	12	10-30	Open forest; meadow edges; orchards
Common Flicker	10	X		12	2¾	7	7	16	6-20	Large trees; open woodlands; forest edges; farm yards
Red-bellied Woodpecker	8	X		12	2¼	—	—	—	—	Forest interior; wooded suburbs to a lesser extent
Red-headed Woodpecker	7	X		20	2	6	6	12	6-20	Forest edges, particularly where snags are abundant
Great Crested Flycatcher	7		X	12	2	6	6	10	6-20	Forest interior; edges to a lesser extent
Eastern Bluebird	5		X	8	1½	5	5	8	5-10	Forest-field edge or savanna—like habitats
Downy Woodpecker	6	X		12	1¼	4	4	10	6-20	Dense young forests
Tufted Titmouse	5		X	12	1¼	4	4	10	6-20	Deciduous forests; suburbia
Black-capped and Carolina Chickadee	4		X	4	1¼	4	4	10	6-20	Almost any kind of forest

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